BLOCK-BASED FRAGMENT FILTRATION WITH FEASIBLE MULTI-GPU ACCELERATION FOR REAL-TIME VOLUME RENDERING ON CONVENTIONAL PERSONAL COMPUTER

ABSTRACT OF THE DISCLOSURE

A computer-based method and system for interactive volume rendering of a large volume data on a conventional personal computer using hardware-accelerated block filtration optimizing uses 3D-textured axis-aligned slices and block filtration. Fragment processing in a rendering pipeline is lessened by passing fragments to various processors selectively in blocks of voxels based on a filtering process operative on slices. The process involves generating a corresponding image texture and performing two-pass rendering, namely a virtual rendering pass and a main rendering pass. Block filtration is divided into static block filtration and dynamic block filtration. The static block filtration locates any view-independent unused signal being passed to a rasterization pipeline. The dynamic block filtration determines any view-dependent unused block generated due to occlusion. Block filtration processes utilize the vertex shader and pixel shader of a GPU in conventional personal computer graphics hardware. The method is for multi-thread, multi-GPU operation.

60179272 v1KRA Fig 4A